REMARKS

In the office action dated February 4, 2005, the Examiner rejected (1) claims 1, 2 and 5-9 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,623,598 issued to Voigt et al. ("Voigt") in view of U.S. Patent No. 6,128,717 issued to Harrison et al. ("Harrison"), and further in view of U.S. Patent No. 5,867,686 issued to Connor et al. ("Connor"); and (2) claims 3 and 4 were rejected under § 103(a) as being unpatentable over Voigt in view of Harrison, Connor and further in view of U.S. Patent No. 5,586,059 issued to Oshelski et al. ("Okhelski"). Reconsideration and allowance of the application are requested.

The present invention is generally directed to a method of presenting system performance to a user in a mass storage system having multiple disk drive storage elements controlled by a disk drive controller. During operation, the disk drive controller receives commands and data from and returns data to multiple host computers. To determine how well the system is performing, the host computers can be operated in coordinated time synchronized fashion to test the controller and the disk drive elements. Accordingly, potential problems that can create bottlenecks on communication lines connected from the controller to either the disk drive elements or the hosts can be identified.

The performance of a large storage system is particularly difficult to measure since there are multiple host computers, which connect to the disk drive controllers, and which can operate at the same time in serial or parallel fashion. As a result, a plurality disk drive elements, usually arranged in a disk drive array, operating in either an independent fashion, a RAID configuration, or a mirrored configuration, e.g., can have a significant yet undetectable bandwidth or operational problems that cannot be addressed or discovered when commands are sent only from a single host computer. The present application addresses this problem by executing at a plurality of the host computers a test request by sending commands to the mass storage system in

coordinated time synchronized fashion, and accumulating, at the executing host computers, data regarding performance of the mass storage system, in response to the requests sent by the host computers.

The host computers can optionally be time synchronized prior to executing the test request (as indicated in new claim 10).

Also, communications can optionally be sent to the host computers to issue the commands prior to executing the test request (as indicated in new claim 11).

Claim 1 is the only independent claim in the present application and, as amended, specifies a method for presenting system performance to a user in a mass storage system. The method features the steps of: (1) executing at a plurality of the host computers a test request by sending commands to the mass storage system in coordinated time synchronized fashion, (2) accumulating, at the executing host computers, data regarding performance of the mass storage system, in response to the requests sent by the host computers, and (3) presenting the accumulated data, in a graphical plot format, for enabling the visualization of trends in the performance of the mass storage system as a function of at least one selected parameter, in response to the host generated commands.

In the office action, the Examiner rejected Claim 1 as being obvious over Voigt in combination with Harrison and Connor. The Examiner states that Voigt and Harrison disclose all the limitations of Claim 1 except for sending commands to a mass storage system in time synchronized fashion. The Examiner states that "Connor teaches sending commands to said mass storage system in time synchronized fashion (see Connor, Abstract)." The Examiner contends that "it would have been obvious ... to further include the teachings of Conner because sending commands to said mass storage system in a time synchronized fashion would have allowed the skilled artisan to transfer data to and from a mass storage device without the software overhead and

would allow multiple hosts to read and write to the mass storage device independently in real time (see Conner, col. 6, lines 5-6)."

Claim 1 has been amended to clarify that a plurality of said host computers execute a test request by sending commands to said mass storage system in a coordinated time synchronized fashion. None of the Voigt, Harrison or Conner references teaches or suggests this step.

The Examiner relies on Conner for purportedly disclosing this step, acknowledging that it is not taught by either Voigt or Harrison. Conner, however, fails to disclose this step. Conner discloses an information storage system that includes a controller for managing the resources for a common mass storage device. This controller enables multiple hosts connected to a common bus to independently read and write to the mass storage device in a high speed manner on a first come, real time basis. (abstract and col. 3, lines 13-18). Conner's multiple hosts do not act in time synchronized fashion, or in any coordinated manner. As indicated above, the hosts act *independently*, and Conner's system includes a controller that enables the hosts to independently read and write to the mass storage in high speed on a *first come basis*.

Moreover, Conner does not suggest hosts acting in time synchronized fashion. There is no need for the hosts to do so because Conner provides a controller that allows them to act independently in high speed. In particular, Conner provides a particular system in which requested address spaces can be locked, and should a subsequent host issue a command to write to a locked address space, the command is aborted, and a flag is set to indicate to the subsequent host that the area is locked. (col. 3, lines 20-28).

As indicated above, the present invention is directed to measuring the performance of storage systems. Conner does not relate to testing of mass storage systems, and does not recognize the problems addressed by the invention. There is simply no need for Conner's hosts to act in time synchronized fashion.

Claim 1 is thus allowable over the Voigt, Harrison and Conner references. The other cited reference, Oshelski, does not cure the defects of Voigt, Harrison and Conner. Claims 2-11 are dependent on Claim 1 and are, therefore, also allowable over the cited references.

Claims 1-11 are pending in the present application. As the application is now in condition for allowance, issuance of a Notice of Allowance is requested.

Respectfully submitted,

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